

Kurukshetra Summary April 2018

ROLE OF ALLIED SECTOR IN RURAL DEVELOPMENT

- The contribution of primary sector to GDP has steadily declined from 53.71 per cent in 1951 to 17.46 percent in 2018. However, declining share of this sector does not undermine its significance in employment generation, foreign exchange earnings and providing food security to the increasing population of the country.
- Interdependence between agriculture and industry become strengthened through the appropriation and generation of various production and demand linkage in these two sector in an upward direction, which results in an increase in trade.

Production and Growth of Agriculture & Allied Sector:

- Food grain production in India went up from 50.8 million tones in 1950-51 to 275.7 million tones in 2016-17 reflecting an annual compound growth rate of 2.60 per cent. Whereas, the production of cereals shot up nearly by six times, the production of pulses went up by less than three times during the period under reference.
- As a result of rapid growth in foodgrain production, per capita per day availability of foodgrains in India increased from 395 gms in 1951 to 506 gms in 2017.
- India has emerged as the second largest fruit and vegetable producer in the world after China. The country occupies first position in the world in the production of fruits like mango, banana, sapota, pomegranate & aonla and vegetables like peas & okra.
- Nearly 19 per cent of the world's total milk production is contributed by India. Total milk production in the country increased from 17 million tones in 1950-51 to 155.5million tones in 2015-16.

Role of Agriculture & Allied Sector:

- The importance of agriculture and allied sector is brought out by the fact that as per Census 2011, of the 313 million mail workers in the country 166 million (56.6%) were engaged in these activities presently, India is not only self-sufficient in food grains but also exports agricultural commodities. India is among the 15 leading exporters of agricultural products in the world.

Structural Changes:

- Over a period of time, the contribution of agriculture & allied sector to real gross value added (GVA) steadily declined from 53.71 per cent 1950-51 to 18.12 per cent in 2016-17.

Government Schemes:

- Steps have been taken to improve soil fertility on a sustainable basis through the *Soil Health Card Scheme*.
- Presently, the net irrigated area in the country is only 68.1 million hectare which is nearly 48% of net sown area. In order to provide improved access to irrigation and enhanced water efficiency, Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) was launched with the motto of *Har Khet Ko Paani*. It also focuses on creating sources for assured irrigation through rainwater harvesting to insure “more crop-per drop”.
- Organic farming relies on the application of fertilizers of organic origin such as compost, vermi-compost, green manure, bio fertilizers and bio-pesticides. It emphasis on the techniques of crop rotation and companion planting mixed cropping and trap crop etc. Indian farmers, with their traditional methods and techniques of farming are poised to encash the immense export potential of organic farming in the country, a new scheme named Paramparagat Krishi Vikash Yojana (PMKVY) was launched in 2015.
- Under this scheme, the willing farmers are required to form a group of minimum 50 farmers with total area of not less than 50 acres. Each farmer enrolling in the scheme is provided a sum Rs. 20,000 (spread over three years) per acre by the government. This fund can be utilized for obtaining agriculture inputs and transporting the produce to the market.
- In order to stabilise the income of farmers by protecting them from the natural calamities a scheme, Pradhan Mantri Fasal Bima Yojana (MPFBY) was launched. Under the scheme, in event of any loss to the notified crop due to any natural calamity, pest or disease, eligible farmers are paid compensation based on the difference between the threshold and actual yield. The threshold yield is calculated based on the average yield for last seven years.

Conclusion

- To improve production and productivity of agriculture, adoption of quality inputs including high yield variety seeds is critical. There is an urgent need to expand the area under irrigation by adopting the appropriate technologies like sprinkler, drip irrigation and rainwater harvesting.
- The rational & efficient use of fertilizers and pesticides is also essential in order to increase productivity and avoid crop yield losses due to pests & diseases. Access to institutional credit at affordable rate is also desired to purchase expensive agricultural inputs.
- Further, the importance of timely Government intervention in agriculture marketing can also not be denied. Last but not least, providing timely advisory services to farmers to adopt best farm practices and technology through market information system is also essential.

ALLIED SECTOR AS CATALYST OF ECONOMIC GROWTH

- Agriculture sector includes agriculture (Agriculture proper & Livestock), Forestry and Logging, Fishing and other related activities.
- Agriculture sector occupies a centre stage in Indian economy embodying three thrust areas: (1) to promote inclusive growth, (2) to enhance rural income, and (3) to sustain food security. As per Census 2011, the total number of agricultural cultivators and agricultural labourers increased from 234.1 million in 2001 to 263 million in 2011.

Horticulture

- Government has taken several initiatives like Mission for Integrated Development of Horticulture production of horticulture crops and reducing post-harvest losses.
- The total horticulture production has increased from 191.8 MT in 2006-07 to about 295.2 MT in 2016-17.

Animal Husbandry and Dairy

- Animals provide nutrient-rich food product, draught fuel, hides & skin, and are a regular source of cash income for rural households. Livestock are natural capital and act as an insurance against income shocks due to crop failure and natural calamities.
- Animal husbandry output constitutes about 30 percent of the country's agricultural output. The fisheries sector contribute 1.0 per cent of the total GDP cost and 5.08 per cent of GDP at factor cost from agriculture, forestry and fishing in the year 2014-15. Livestock sector provide regular employment to 11 million in principal status and 9 million in subsidiary status. Women constitute 70 per cent of the labour force in livestock sector as against 35 per cent in crop farming.

Livestock for Farmer's Economy:

The livestock serve the farmers in different ways:

1. **Income:** Livestock is a source of subsidiary income for many families in India especially the resource poor who maintain few heads of animals.
2. **Employment:** The land less and less land people depend upon livestock for utilizing their labour during lean agricultural season.
3. **Food:** The livestock products such as milk, meat and eggs are an important source of animal protein to the members of the livestock owners.
4. **Social Security:** The animals offer social security to the owners and status in the society. The families especially the landless which own animals are better placed than those who do not. Rearing of animals is a part of the Indian culture.
5. **Draft:** The farmers, depend upon bullocks for ploughing, carting and transport of both inputs and outputs.

6. **Dung:** In rural areas dung is used for several purposes which include fuel (Dung cakes), fertilizers (farm yard manure), and plastering materials (poor man's cement)

Fisheries

- Fish production has increased from 0.75 million tonnes in 1950-51 to 8.4 million tonnes during 2017-18. This resulted in an unparalleled average annual growth rate of over 4.5 per cent over the years which has placed the country at the forefront of global fish production, only after China.
- Besides meeting the domestic on fishing and related activities for their livelihood, Fishery sector also earns foreign exchange to the tune of US\$ 3.34 billion (2017-18) from export of fish and fisheries products.
- India is also an important country that produces fish through aquaculture in the world. India is home to more than 10 per cent of the global fish diversity.
- As the second largest country in aquaculture production, the share of inland fisheries and aquaculture has gone up from 46 per cent in the 1980s to over 85 percent in recent years in total fish production.

Forestry

- India is one of the ten most forest-rich countries of the world along with Russia, Brazil, Canada, United States of America, China, Democratic Republic of the Congo, Australia, Indonesia and Sudan.
- India's forest cover grew at 0.20 per cent annually over 1990-2010 and has grown at the rate of 0.7 per cent per year over 2000-2010.
- As of 2016-17, India's forest cover was 79.42 million hectares, or 21.16 per cent of the country's total area. In 2015, forestry industry contributed 1.3 per cent to India's GDP.
- India is a significant important of forest products. Logs account for 72 percent of all wood and wood product imported into India due to local preference for unprocessed wood.
- The Indian market is accustomed to teak and other hardwoods that are perceived to be more resistant to termites, decay and are able to withstand the tropical climate.
- India is the world's third largest hardwood log importer.

Conclusion

- Rural India is becoming less and less agricultural, and allied activities are now a very important part of the livelihood strategies. The allied agricultural sector contributes significantly to economic growth, income diversification, rural employment and poverty reduction.

ECONOMIC PROSPECTS OF DAIRY DEVELOPMENT

- India has accepted the cattle and dairy related products since mythological ages. The scientific revelation and data generation and monitoring since independence showed that the country is unique repository of genetic resources.

Cattle Population Scenario

- According to 19th Livestock Census (2012), Govt. of India, 190.90 million cattle are contributing about 37.28% of total livestock population in the country.
- Till 2017, 43 indigenous cattle breeds whose breed characteristics are well defined have been listed as descript cattle in the country.
- Although crossbred cattle population has increased during 1997-2012, the indigenous cattle are found more sustainable in comparison to crossbred cattle. Indigenous dairy cattle are also known for being more heat tolerant, comparatively resistance to many diseases; need low maintenance cost and higher feed conversion efficiency.
- Of late, the indigenous cattle in the country are also slowly getting important due to scientific revelation of functional quality of milk.

Milk Production Scenario

- During 2014-15 to 2016-17, the Economic Survey recorded the average annual growth rate of milk production around 5.94% and as a result, the milk production increased to 163.7 million tons in 2016-2017. The per capita availability of milk in the country was also increased to about 352 g/day, though the per capita availability of milk varies dynamically from state to state mainly due to diverse food habits of human population.
- In India, about 113.25 million (74.92%) indigenous cattle, still defined as non-descript cattle, are distributed mainly in small herd of 2-3 animals and reared by small and marginal farmers of different socio-economic conditions under diverse 20 agro-climatic zones of the country. Thus though the milk production from cattle has increase in the country, yet the average milk production of exotic, crossbred, indigenous and non-descriptive cattle in 2016-17 has been found to be very low as compared to the productivity of the cattle from developed countries.

Dairy Development in India

- The massive scientific dairy development was mostly emerged in 1960 when the country realized the shortage of milk and milk products. During this period, the country initiated the All India Coordinated Research Project on Cattle and also started crossbreeding programme through crossing of exotic dairy breeds non-descript cattle to increase the milk production for dairy development.
- The National Dairy Development Board (NDDB) was founded in 1965.

- The major programme for dairy development initiated by NDDDB in three phases was Operation Flood Programme during 1970-1996 with the main objectives of increasing milk production, augment rural income and reasonable prices for consumers.

Cattle and Dairy Development in India: Challenges and Strategies

- **Prioritization of breed:** There is a need to prioritize based on availability of cattle breeds as per their economic importance which will be helpful for selecting economically important breeds in order to develop the dairies.
- To sustain the improved productivity of crossbreds and to minimize the decline in reproductive performance, there is a need to develop the sustainable breeding strategy.
- **Shortage of Male Germplasm/Breeding Bulls:** The dairy stakeholders are not able to select the breeds which are adaptable in a particular region due to non-availability of male Germplasm of climate resilient breeds. There is a huge deficit of frozen semen doses of different breeds to cover the breedable population in the country.
- There is a need to identify more high genetic merit bulls and to establish more 'Bull Mother Farms' of various breeds to ensure availability of superior quality male Germplasm by 2022 in the country.
- The Department of Animal Husbandry & Dairying, Ministry of Agriculture & Farmers' Welfare, Govt. of India has reoriented/launched the schemes like National Programme for Bovine Breeding, National Project for Dairy Development, Rashtriya, Gokul Mission, National Mission on Bovine Productivity Central Cattle Development Organization.
- **Assisted reproductive Techniques (ARTs):** The DADF, MoAFW, Gol has initiated the massive programme on assisted reproductive techniques (ARTs) like adoption of Multiple Ovulation and Embryo Transfer (MOET) technology.
- **Sex semen Technology:** The adoption of sex semen technology in cattle will bring the significant change in dairy development in the country.
- The DADF, MoAFW, Gol has initiated the sex semen scheme which will not only help to increase the annual genetic gain for the traits by increasing selection differential, intensity of selection and reducing the generation interval for also reduce the huge burden of non-productive males in the country.
- **Acute Shortage of feeds and fodders:** At present, there is an acute shortage of feeds and fodders in the country. The DADF, MoAFW, Gol has launched National Livestock Mission (NLM) to cover all the activities required to ensure quantitative and qualitative improvement in livestock production systems and capacity building of all stakeholders.
- Recently Haryana Government has taken the initiative to distribute quality fodder seed mini kits of Berseem and Oat during Rabi season (2017-18) under NLM.
- **Reproductive Problems:** High producing cows suffer more reproductive problems including fertility as milk production is antagonistically related to fertility.
- **Metabolism diseases and Udder Disorders:** Metabolic disorders like milk fever, ketosis, downer cow syndrome etc affect high producing dairy cattle immediately after parturition.
- **Implementation of Central and Centrally Sponsored Schemes on health coverage of cattle:** The centre and state governments have initiated many schemes for prevention of various diseases of cattle.

- **Skilled Human Resource Development:** The dairy development in any country demands the service of skilled human resources. Therefore, it is of utmost importance to develop well trained, competent and dedicated human resources.
- **Development of Dairy Entrepreneurs:** More initiatives are needed to motivate the dairy stakeholders to become start-up/dairy entrepreneurs in India. The DADF, MoAFW, GoI has initiated Dairy Entrepreneurship Development Scheme for strengthening the dairy development and creating more opportunity for the up-coming dairy stakeholders.
- **Strengthening Dairy Development Extension Programmes:** The dairy development in India demands a networking of various extension activities as the milk procurement is based on different milk shed areas where, the dairy stakeholders are the custodian of different breeds of indigenous and crossbred cattle.

Cattle and Dairy Development in India: Economic Prospects:

- The roadmaps for increasing the economic prospects through dairy development will be as follows.
- **Remunerative Price of Cow Milk**
- **Dairying with High Producing Cattle:** The dairying with high producing cattle along with the knowledge of technology will directly transform the growth and economic prospects of dairy development in the country.
- **Promoting Dairy based Precision Organic Farming:** The concept of organic milk is gaining importance in the country.
- **Dairy Development based on A2 brand milk:** The acceptance of indigenous cow milk as A2 milk is of late gaining popularity as it is available now in the domestic market. In many states, the indigenous cattle breed associations/start up have formed to promote the indigenous cow milk highlighting the importance of A2 allele and consumers are paying more price per liter of milk due to the health reasons.
- **Dairy Development based on Milk as Functional Dairy Food:** The economic prospects of dairy development in future may grow by considering milk as functional dairy food.

NEW DIMENSIONS OF BLUE REVOLUTION

- India has a coast line of 8118 km, having a huge potential for aquaculture, inland and marine fisheries. Marine Fisheries .
- As per NFDB, India ranked 3rd in fish production and 2nd in aquaculture in the world. Fisheries contribute 1.07 per cent of the total GDP of the country. Further, as per the central plan scheme under the banner of **Blue Revolution (Neel Kranti)**, it has been targeted to enhance the fish production from 107.95 lakh tonnes in 2015-16 to about 15 lakh tonnes by the end of Financial Year 2019-20.

Information Technology (IT) Interventions:

- The main challenges of fisheries development in the country includes availability of accurate data on assessment of technologies for fin and shell fish culture, yield optimization , harvest and post-harvest operations, fishery resources survey, monitoring and assessment, welfare of fishermen. IT can help to overcome these challenges and also assist people to be heard through social networking and knowledge sharing.

Technology Interventions in New National Policy for Marine Fisheries: Leading Towards Blue Revolution:

- In 2017, the Ministry of Agriculture & Farmer's Welfare has come out with a new national policy on fisheries paving the way to achieve "Blue Revolution" through implementation of an ambitious scheme for integrated development and management of fisheries.
- The new policy will cover development and management of inland fisheries, aquaculture, marine fisheries including deep sea fishing and all activities undertaken by the National fisheries Development Board (NFDB) towards realizing a 'Blue Revolution' in the country.
- The new National policy on Marine Fisheries lays emphasis on bringing sustainable utilization of the fisheries wealth from marine and other aquatic resources.
- Other features of the Policy include the use of IT and space technology for improving the capacities of the fishing communities, strengthening the MCS system by introducing chip based smart registration cards for fishermen to avoid the crossing the international marine boundary line.
- The new policy also focuses on conservation in production processes, species specific and area specific management plans, and spatial and temporal measures for sustainable utilization of resources. It is aimed at encouraging an integrated approach on fisheries management, besides blending traditional knowledge and scientific business principles.
- Simultaneously, the government will also undertake review and periodic evaluation of the existing marine protected areas. Government would also go for providing legislative support to ensure that tenure rights of traditional fisherman are secure and their livelihood not affected by conservation measures.

- The blue revolution is being implemented to achieve economic prosperity of fishermen and fish farmers and to contribute towards food and nutritional security through optimum utilization of water resources for fisheries development in a sustainable manner.

Conclusion

- Fish as a protein source, plays an important role in maintaining food security for the human population.
- Meanwhile, in the term of economy, fish products are classified among the most traded commodities and manage to assist creation of employment, income provision and regional economic growth and development.
- The unparalleled average annual growth rate of over 4.5% over the years has placed the country on the forefront of global fish production. Besides meeting the domestic needs, the dependence of over 14.5 million people on fisheries activities for their livelihood and foreign exchange earnings from the fisheries produce, amply justifies the importance of the sector on the country's economy and also livelihood security.
- It is estimated that the fish requirement of the country by 2025 would be of the order of 16 million tonnes, of which at least 10 million tonnes need to come from aquaculture. Therefore, development of road map based on available resources, through technological intervention is necessary to achieve this target.

ORGANIC FARMING FOR SUSTAINABLE ENVIRONMENT

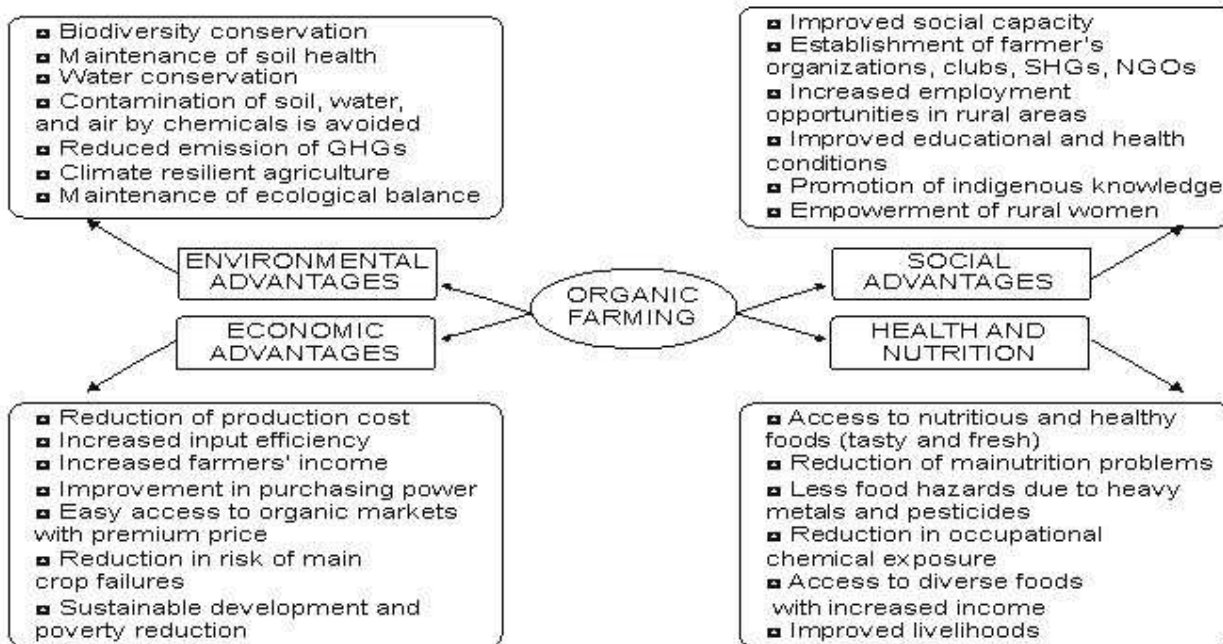
- The hazards of the intensive agricultural system are threatening as they drastically affect the ecological balance. Thus, we started thinking towards organic farming (OF) systems approach.
- The International Federation of Organic Agriculture Movement (IFOAM) is an international organization which regulates the standards of OF and strengthens the organic movement globally.
- According to IFOAM, "Organic Agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved".
- Besides other benefits of OF, the system also guarantees the production of healthy foods. This is an important issue because in India, undernutrition and obesity (overnutrition) are the major dual nutrition burdens at present. Recently, National Nutrition Mission (NNM) was launched to overcome the nutrition related problems in the country.
- OF system includes:
 - Biological farming
 - Nature farming
 - Regeneration agriculture

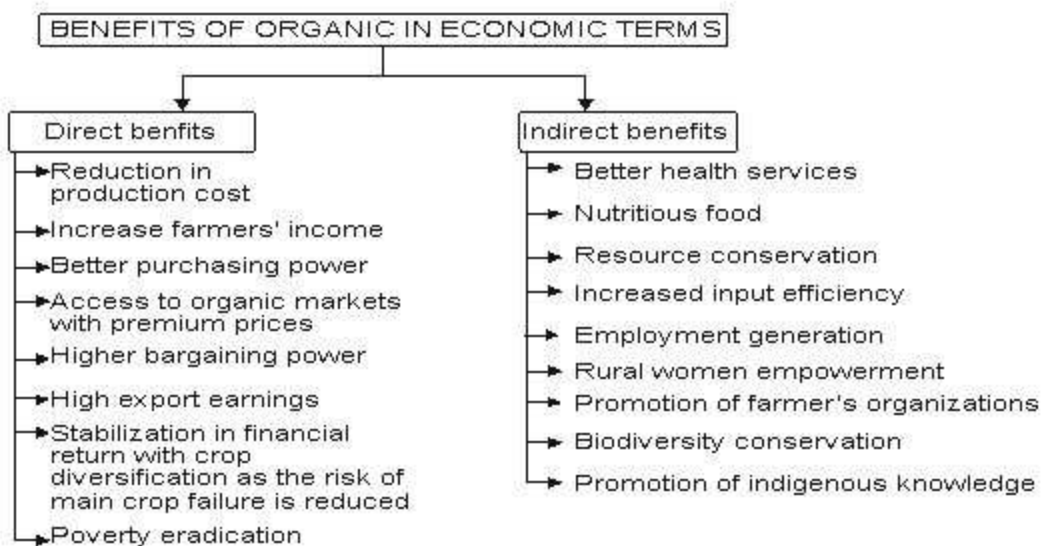
- Alternate agriculture
- Permaculture
- Low inputs sustainable agriculture

Components of Organic Farming:

- a) **Crop and Soil Management:** In this component, we give stress in selection of variety, timely sowing, crop rotation, green manuring, intercropping with legumes, etc.
- b) **Nutrient Management:** This is dealt with the use of organic materials such as farmyard manure, compost, vermicompost, crop residues, green manures, and cover crops.
- c) **Plant Protection:** Insects, pathogens, and other pests are controlled by primarily relying on crop rotations, natural predators, resistant varieties, diversity, and tillage.
- d) **Livestock Management:**
- e) **Soil and water Conservation**

Importance of Organic Farming:





Limitations of Organic Farming:

- Time taking process
- Initially low yields are observed
- Easy availability of chemicals
- Requirement of large organic inputs
- Low availability of quality inputs
- Marketing facilities are less.
- Certification process
- Research facilities are less
- Training facilities for formers are less.

Organizations and Governments Schemes/Initiatives promoting Organic Farming:

- **National Organic Farming Research Institute, Gangtok, Sikkim:** For promoting research and education and conducting training on organic production systems.
- **National Centre of Organic Farming, Ghaziabad, Uttar Pradesh:** For implementing a Centrally Sponsored Scheme (CSS), i.e., National Project on Organic Farming.
- **Participatory Guarantee System (PGS):** A participatory approach for the stakeholders to assess, inspect, and verify the production practices of each other and take decision on organic certification (PGS-Green and PGS-Organic).
- **Paramparagat Krishi Vikas Yojana:** This is an expanded component of Soil Health Management (SHM) of a major CSS, National Mission of Sustainable Agriculture (NMSA), launched in 2015. The latest technologies of OF are disseminated in villages among youths and farmers by cluster method and PGS certification.

Organic Farming in Indian Economy:

- Sikkim is India's first fully organic state. The north eastern states are practicing organic agriculture. In other states, some certified organic farms are run by different agencies.

Conclusion

- Low economic returns in the initial stage restrain farmers to adopt OF practices. But this indicates the lack of knowledge about the merits of OF among farmers. Government agencies and schemes should try to fill this gap by giving demonstrations of the techniques of OF to make the farming community expert in the alternative methods of the conventional farming.
- More research should be conducted for validation of organic methods in field, as India has huge potential for organic crop production.

GOBAR DHAN: WASTE TO WEALTH

- The Galvanizing Organic Bio-Agro Resources Dhan (GOBAR-DHAN) scheme has been announced by Government of India in 2018.
- Under this scheme, the cattle, dung, kitchen waste and agriculture waste can be utilized to create biogas-based energy. The objectives of this initiative is to make villages clean and to generate wealth and energy from cattle and other waste. The Swachh Bharat Mission –Gramin will pilot this initiative. The GOBAR-Dhan initiative is expected to create opportunities to convert cattle dung and other organic waste to compost, biogas and even larger scale bio-CNG units.
- It aims at the collection and aggregation of cattle dung and solid waste across clusters of villages for sale to entrepreneurs to produce organic manure, biogas/bio-CNG. The scheme will provide many benefits to rural people by keeping villages clean and sanitized, improving livestock health and increasing farm yields. Under it, biogas generation will help to increase self-reliance in energy utilized for cooking and lighting. It will create new opportunities for jobs linked to waste collection, transportation, biogas sale etc. According to a study by International Labour Organization during 2014, the productive use of dung could support 1.5 million jobs nationally and there is a significant potential for farmers to generate income from the sale of cattle dung. It will also provide stable fuel supply in market for oil companies and accessible credit in market through government schemes and banks for entrepreneurs.

INTEGRATED DEVELOPMENT OF HORTICULTURE

- Horticulture contributes 30 per cent to GDP of agriculture from nearly 13 per cent of the total cropped area and support nearly 20 per cent of the agricultural labour force.

- In 2016-17, production of horticulture crops comprising of fruits, vegetables and species touched a record high of 300 million tonnes, surpassing the production of foodgrains for the fifth year in a row.
- According to the first advance estimate of the Agriculture Ministry for the year, the total production is expected to be 350.4 million tonnes – nearly 5 million tonnes more than the production in 2016-17. Higher production is mainly attributed to increase in productivity as sown area under the horticulture crops has increased only marginally over the years.

Recently Policy Initiatives

- Central Government has taken major initiatives in 10th and 11th Five Year Plans for accelerating the growth of horticulture in the country. A National Horticulture Mission was launched in 2005-2006 as a Centrally Sponsored Scheme to promote holistic growth of the horticulture sector through an area based regionally differentiated strategies.
- It is during this period that three flagship schemes namely, National Horticulture Mission, Horticulture Mission of NE and Hilly Areas and Rashtriya Krishi Vikas Yojana having impact of horticulture development were implemented simultaneously.
- Success of these schemes prompted the Central Government to launch Mission for Integrated Development of Horticulture (MIDH) during XII Plan for holistic growth of the horticulture sector covering fruits, vegetables, root and tuber crops, mushrooms, spices, flowers, aromatic plants, coconut, cashew, cocoa and bamboo.
- The budget for 2018-19 proposes to set up state-of-the-art facility in 42 mega food parks which are in different stages of functioning.
- This scheme has been designed for higher price for farmers from their produce, creating of high quality food processing infrastructure, reduction in food wastage, and creation of an efficient food supply chain, among others.
- Food processing industry has huge potential of employment generation.

Emphasis on Better Post-harvest Handling and Cold Chain Facilities

- In India, there is a need to upgrade cold chain logistic for better post-harvest handling of the horticulture produce. The present capacity of cold storage is estimated at around 32 million tonnes in the country. Ministry of Food Processing Industries has launched 'Pradhan Mantri Kisan Sampada' Yojana for Integrated Cold Chain and Value Addition Infrastructure' for which expression of interest is invited from time to time.

Better Pricing of Crop Harvest:

- Marketing system also need strengthening and modernization in realizing better prices for the crop produce for the farmers. Last year, the coverage of National Agricultural Market (e-NAM) was expanded.

- This year, Rs. 2,000-crore funds has been provided for the development of agri-markets. This initiative will help upgrading agricultural marketing infrastructure in the 22,000 Grameen Agricultural Markets (GrAMs) and 585 APMCs.

Strengthening of Irrigation Potential:

- According to a recent concept paper of NITI Aayog, out of 160 million hectares of cultivable land in India, only about 65 million hectares or 41 per cent is covered under irrigation.

Development of Technology-based Precise Crop Production Packages

- There is need to make use of Space Technology in making a weather-based and soil-characteristics based profile of the cultivable land in different parts of the country. The Agriculture Ministry is working on a project called CHAMAN (Coordinate Horticulture Assessment and Management using geo-informatics) which is making use of satellites and remote sensing technology. CHAMAN project will help in accurate forecasting of area and production of seven major crops in about 185 districts across India.
- The project is being implemented by the Delhi-based Mahalanobis National Crop Forecast Centre and is likely to be completed by March.

Priority Issues for the Future

- **Quality Planting Material:** unorganized sector is the source of more than 60 per cent planting material. Further, most of the nurseries in production of horticulture planting material are engaged in ornamental plant production and are concentrated in the vicinity of towns and cities.
- **High Density Planting (HDP):** High density planting accompanied with assured irrigation and higher application of essential nutrients can be an important technological intervention for increasing the productivity in important fruit crops.
- **High-tech Protected Cultivation:** Protected cultivation is high-tech cultivation which result in 5 to 12 times higher output than cultivation in the open field.
- In India, protected cultivation under polyhouses is negligible in comparison to some of the leading countries in the field of protected cultivation.
- In Haryana, National Horticulture Mission (NHM) has joined hands with Israel to rope in farmers in protected cultivation in vegetable farming.
- **Strengthening of Logistics for Better Post-harvest Handling of Crop Harvest:** Such facilities are essential to increase our exports to the other countries. As majority of horticulture produce is perishable in nature, there is need for setting up of international air cargo services and cold storage facilities at all the major airports.
- **Need to Streamline Marketing of Crop Harvest:**
- **Infusion of Recent Scientific Advances in Crop Production Technologies:**

- **Need to Modernize Technology Transfer Tools:** A comprehensive Kisan knowledge Management System (KKMS) should be developed to provide and disseminate information related to the modern technologies, modern farm implements, best agriculture practices and post-harvest management practices, including market information.
- There are various interventions like Village Knowledge Centres, Farm Schools, Farmer's Clubs, Kisan Call Centres, Radio and Television, Mobile Phones, Internet and dedicated television Kisan Channel of Doordarshan which are making a good impact and their delivery system should be made more effective and target oriented.
- **Need for Integrated Disease and Pest Management Strategies:**
- **Strategies to Mitigate Climate Change:** Climate change will significantly influence productivity, production and quality of horticultural crops. In temperate and sub-tropical crops, there will be area shift in cultivation is shifting to higher elevations. Such changes will necessitate the change of crops in different areas, varietal changes and changes in crop production technologies.



FLORICULTURE INITIATIVES IN INDIA

- Floriculture includes cultivation of flowering and ornamental plants for direct sale or for use as raw materials in cosmetic and perfume industry and in the pharmaceutical sector.
- The leading flower producing country in the world is Netherlands and Germany is the biggest importer of flowers.

Floriculture in India

- The production and trade of floriculture has increased consistently over the last 10 years.
- Government of India has indentified floriculture as a sunrise industry and accorded it 100% export oriented status.
- Indian floriculture industry has been shifting from traditional flowers to cut flowers for export purposes.
- Agricultural and Processed Food Products Export Development Authority (APEDA), is responsible for export promotion and development of floriculture in India.

Economic Importance of Flower Production

- Perfume industries can be established in the country which can help improving national economy.
- Flowers can be a source of earning huge foreign currency by exporting them.
- Flowers can be considered as a commercial commodity. Commercial flower production may be helpful in increased earning of the grower.
- Establishment of flower production farms and perfume industries can help solving unemployment problem to a large extent.
- It provides scope to bring more unused land under flower cultivation.

Flower Cultivation

- Among states, Karnataka is the leader in floriculture.
- Other major flower growing states are Tamil Nadu and Andhra Pradesh in the South, West Bengal in the East, Maharashtra in the West and Rajasthan, Delhi and Haryana in the North. The expert committee set up by Govt. of India for promotion of export oriented floriculture units has identified Bangalore, Pune, New Delhi and Hyderabad as the major areas suitable for such activity especially for cut flowers.

Marketing

- In India, marketing of cut flowers is much unorganized.
- The packaging and transportation of flowers from the farms to the retail markets at present is very unscientific.

Export Constraints

- In spite of an abundant and varied production base, India's export of floricultural product is not encouraging. The low performance is attributed to many constraints like non-availability of air space in major airlines.
- The Indian floriculture industry is facing with a number of challenges mainly related to trade environment, infrastructure and marketing issues such as high import tariff, low availability of perishable carriers, higher freight rates and inadequate refrigerated and transport facilities.
- At the production level the industry is faced with challenges mostly related to availability of basic inputs including quality seeds and planting materials, efficient irrigation system and skilled manpower.

Government Programmes and Policies:

- Department of Agriculture and Cooperation under the Ministry of Agriculture is the nodal organization responsible for development of the floriculture sector.
- The 100% Export Oriented Units are also given benefits like duty free imports of capital goods. Import duties have also been reduced on cut flowers, flower seeds, tissue-cultured plants, etc. Setting up of walk in type cold storage has been allowed at the International airports for storage of export produce.
- "Integrated Development of Commercial Floriculture" aims at improvements of Commercial and productivity of traditional as well as cut flowers through availability of quality planting material, production of off season and quality flowers through protected cultivation, improvement in post harvest handling of flowers and training persons for a scientific floriculture.

VACCINES A CRUCIAL PILLAR OF PUBLIC HEALTH

- Several countries are positioning immunization as an important component of Sustainable Development Goals 2030.

Need for immunisation programme for India:

- With the second largest population, around 2.7 crore children are born every year. India also has the largest burden of under-five mortality.
- Vaccine-preventable diseases such as pneumonia and diarrhoea are the leading under-five childhood killers. One child loses his/her life to pneumonia and diarrhoea every two minutes.
- Immunisation is widely accepted as the most cost-effective public health intervention that is capable of yielding manifold returns.
- According to a study published in Lancet in 2014, investing in health and increasing health expenditure by just \$5 per person per year up to 2035 in 74 high-burden countries could yield up to nine times that value in economic and social benefits.

Challenges and initiatives:

- India however-faces three prominent challenges. Firstly at 62% the full immunisation, coverage is considered a low level. There was a limited basket vaccines. Also, there have been issues regarding the quality and logistics of vaccine management for such a vast country.
- Recognising the potential of vaccines, the government has taken multiple steps to boost the scope and span of immunisation. The Universal Immunisation Programme (UIP), launched in 1985, is one of the largest immunisation programs of the world in terms of the geographical spread and diversity of areas covered, quantities of vaccine used and immunisation sessions, and the beneficiaries.
- To hasten the rate to at least 90% coverage till 2020, the Health Ministry launched Mission Indradhanush in 2014, where seven vaccines (diphtheria, whooping cough, tetanus, polio, tuberculosis, measles and hepatitis B, meningitis and pneumonia due to Haemophilus influenzae type B; Japanese Encephalitis is also being provided in selected endemic districts of the country.
- It targets those areas where the number of unvaccinated and partially vaccinated children is the highest. There has been a concerted effort to expand the basket of vaccines.
- In 2016, Rotavirus vaccine was introduced to combat Rotavirus, Diarrhoea which can lead to malnutrition, stunted growth and even death.
- Further, with a target to free India's children from the highly contagious measles disease by 2018, the Measles-Rubella (MR) vaccine has also been launched this year.
- Pneumococcal Vaccine (PCV) has been launched in May 2017 for reducing infant mortality and morbidity caused by pneumococcal pneumonia.
- As part of the global polio endgame strategy, Inactivated Polio Vaccine (IPV) was introduced in the UIP in Nov 2015 and expanded across the country by June 2016.

- The quality of vaccines through maintenance of the right temperature all through the logistical chain is crucial. It is also vital that program managers have real time information about the available stock of vaccines so that they do not face a stock-out situation. To ensure these, the Ministry of Health and Family Welfare launched an innovative digital platform to monitor the vaccine supply chain in real-time, called the Electronic Vaccine intelligence Network (eVIN).

Achievements:

- The country was declared free of polio in 2014, and has remained so due to the nation-wide Pulse Polio immunisation programme.
- Another monumental public health achievement has been validation of India for Maternal and Neonatal Tetanus Elimination (MNTE) in April 2015, much earlier than the global date of December 2015. This is another milestone India has crossed in public health.
- The infant mortality and under-five mortality rates are declining. Between 2013 and 2015, an estimated 2.7 lakh children were saved, whereas during 2005-2015, death of one million infants was averted. Much of this success can be attributed to the immunization programme in the country.

